



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 REGION 5 CHICAGO REGIONAL LABORATORY
 536 SOUTH CLARK STREET
 CHICAGO, ILLINOIS 60605



Date: 7/13/2017

Subject: Review of Region 5 Data for Mid America Steel Drum, Inc.

To: RCRA, LCD, US EPA Region 5
 77 West Jackson Boulevard
 Chicago, IL 60604

From: Greg Mitsakopoulos, Chemist
 US EPA Region 5 Chicago Regional Laboratory

The data transmitted under this cover memo successfully passed CRL's data review procedures as documented in the current Quality Management Plan and applicable Standard Operating Procedures. In accordance with the EPA QA/G-8 *Guidance on Environmental Data Verification and Data Validation* and the U.S. EPA Region 5 RMD QMP, CRL performs data verification on all the data generated internally. CRL does not perform data validation or quality assessment procedures.

This report was reviewed and the information provided herein accurately represents the analysis performed.

X Greg Mitsakopoulos 7/13/17

Please contact the analyst with any technical report issues, Robert Thompson at (312)-353-9078 for sample project concerns, and Sylvia Griffin at (312)-353-9073 with data transmittal questions. Thank you.

Attached are Results for: Mid America Steel Drum, Inc.

 Data Coordinator and Date Transmitted

Analyses included in this report:

Metals, TCLP ICP (w/o Hg)



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RCRA, LCD, US EPA Region 5
77 West Jackson Boulevard
Chicago IL, 60604

Project: Mid America Steel Drum, Inc.
Project Number: MASD 05-04-17
Project Manager: Jamie Paulin

Reported:
Jul-13-17 12:07

Analysis Case Narrative

General Information

This narrative pertains to the ICP-AES analysis of TCLP samples for arsenic, barium, cadmium, chromium, lead, silver, and selenium. All holding times were met. Designated analyst Greg Mitsakopoulos may be reached at (312) 353-0377. The raw data are to be filed under work order 1705002.

work order	TCLP ICP count *	received on
1705002	8	5/5/17
1705003	7	" "
1705004	4	" "

* The count of samples that underwent analysis is shown. TCLP metals tests for a few submitted samples were cancelled based on CRL observations on sample nature with respect to feasibility of testing and with consultation with the client.

<u>process</u>	<u>SOP</u>
TCLP extraction	Gen019 v. 5 (SW-846: 1311)
sample digestion	Metals025 v. 3 (based on EPA Method200.2)
analysis	Metals003 v. 6 (based on EPA Method200.7 and 6010D)

Matrix spike volumes were adjusted in the electronic bench sheet record to account for the dilutions in the digestion, so recovery calculations would be correct in terms of the undiluted TCLP extract

Sample Analysis and Results

The data reported herein meets the requirements referenced in the SOP(s) used for analysis and any laboratory specifications stated in the "Land and Chemicals Division Generic Quality Assurance Project Plan for Field Sampling Events at Mid-America Steel Drum, Inc.", dated April 19, 2017.

The original hard copies of the TCLP preparation are in the data package for the SVOCs

TCLP extraction preparation

TCLP extracts were prepared by analysts D. Kleinmaier, T. Strock, A. Wroble, and this analyst. TCLP preparation was quite challenging, as some of the sample characteristics varied from powders, to viscous multiphase systems, to non-aqueous components, and from highly acidic to highly basic. Limited amounts of sample were available to a procedure that requires more, the more complex the sample.



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Most of the reported results represent the (complete) TCLP extract, since they originated from method-defined 100% solid or 100% liquid samples, or, the resultant TCLP phases were proportionally added together. But, it was not possible to leach the solids for four of the samples defined by the TCLP procedure to contain greater than 0.5% solids to undergo leaching. Thus, only first-filtrate results are reported for 1705002-03, 1705003-01, 1705003-03, and 1705003-06. Since all TCLP ICP metals were below reporting limits in the first filtrates, no attempt was made to mathematically treat these with hypothetical dilutions of leachates. This is sound because the application of a dilution factor to a result that is below reporting limit is still a result below reporting limit.

Preservation of TCLP extracts

Four of the TCLP extracts were not preserved with acid before digestion due to one or more of the following reasons:

- * The expected amount of acid would significantly change the sample matrix
- * The sample is very basic and precipitation or violent reaction might occur
- * Field information and lab observations were such that the sample is expected to be mostly or totally non-aqueous, and thus a pH based on aqueous calibration standards does not make sense
- * The TCLP procedure and the amount of sample submitted to the lab resulted in a limited amount of extract to be shared with the entire lab; some analyses cannot use acid-preserved extracts

Per SOP Gen019, unpreserved extracts were held under refrigeration at 4 degrees C or less until digestion. Unpreserved extracts are indicated on the digestion bench sheets.

Digestion and dilutions of TCLP extracts analysis

To maximize the effectiveness of the digestion acids and to protect the tracelevel ICP instrument, TCLP extracts of field samples were accordingly processed with dilutions in the digestion.

The TCLP process resulted in extracts with a leached fraction for twelve of the samples. A twenty-fold dilution was selected, since the leaching process is in effect a dilution of the field sample. This dilution level still allows the regulatory limits of all of the TCLP ICP metals to be reported. Regulatory levels of these metals were not found.

For the remaining seven samples, the extract was a filtrate of unleached sample. This meant these were probably of a concentrated nature, yet the established digestion and analysis methods are built for aqueous environmental samples. It was anticipated based on this, along with field information and lab observations, these would be difficult to digest and analyze without harm to the instrument or analyst and thus were digested at a dilution factor of one thousand. None of the TCLP ICP metals were found at the resultant reporting limits.

In the raw instrument data for sample 1705002-05 cadmium was more negative than the reporting limit. Since this effect was not seen in the alternate cadmium line the "U" result will stand as-is.



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Quality Control

All quality control (QC) audits for the study analytes were within CRL's limits or did not result in qualification of the data, except for the following:

Extraction Fluid Blank: Limit = \pm method detection limit (MDL). The extraction fluid blank from 5/18/17 had 0.031 mg/L barium (MDL 0.0091 mg/L barium). Samples processed with this extraction fluid, with less than ten times the blank amount are flagged "K" for potential high bias: 1705003-04, 1705003-07, 1705004-07, and 1705004-08.

Laboratory Fortified Blank (BS): recovery limit = $100\% \pm 15\%$. Silver recovery in B17E050-BS1 was 52%. It's evident that an error was made when preparing the blank spike sample. No field samples will be flagged, as none are above the silver reporting limit, the matrix spike audits passed, and the instrument quality control audits passed.

Field Duplicates: CRL does not have audit limits for field duplication. But for information, the field samples have been compared to the audit limits for laboratory duplicates: Relative Percent Deviation (RPD) 20%, or an absolute difference below method detection limit (MDL), when near MDL. With respect to TCLP ICP metals above reporting limits- barium in this case- the field-identified pair 1705004-09 and 1705004-10 showed good agreement. For the field-identified pair 1705002-10 and 170500241, none of the TCLP ICP metals were above reporting limits.



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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
OCS-01	1705002-01	Other	May-04-17 12:55	May-05-17 07:50
OCS-03	1705002-03	Other	May-04-17 13:35	May-05-17 07:50
OCS-05	1705002-05	Other	May-04-17 14:23	May-05-17 07:50
OCS-06	1705002-06	Other	May-04-17 14:37	May-05-17 07:50
OCS-07	1705002-07	Other	May-04-17 14:50	May-05-17 07:50
OCS-10	1705002-10	Other	May-04-17 15:20	May-05-17 07:50
OCS-10 DUP	1705002-11	Other	May-04-17 15:20	May-05-17 07:50
OCS-12	1705002-13	Other	May-04-17 15:50	May-05-17 07:50
CS-01	1705003-01	Other	May-04-17 11:48	May-05-17 07:50
CS-03	1705003-03	Other	May-04-17 12:35	May-05-17 07:50
CS-04	1705003-04	Other	May-04-17 13:02	May-05-17 07:50
CS-05	1705003-05	Other	May-04-17 13:12	May-05-17 07:50
CS-06	1705003-06	Other	May-04-17 13:29	May-05-17 07:50
CS-07	1705003-07	Other	May-04-17 13:55	May-05-17 07:50
CS-08	1705003-08	Other	May-04-17 14:15	May-05-17 07:50
SFS08	1705004-07	Other	May-04-17 15:10	May-05-17 07:50
SFS09	1705004-08	Other	May-04-17 15:23	May-05-17 07:50
SFS10	1705004-09	Other	May-04-17 15:37	May-05-17 07:50
SFS10 Dup	1705004-10	Other	May-04-17 15:37	May-05-17 07:50



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Metals by ICP, TCLP Extracts using EPA 1311 & 200.7 (modified) US EPA Region 5 Chicago Regional Laboratory

OCS-01 (1705002-01) Matrix: Other Sampled: May-04-17 12:55 Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			40.0	mg/L	1000	B17E050	Jun-02-17	Jun-05-17
Barium	U			3.00	"	"	"	"	Jun-05-17
Cadmium	U			2.00	"	"	"	"	Jun-05-17
Chromium	U			5.00	"	"	"	"	"
Lead	U			30.0	"	"	"	"	"
Selenium	U			50.0	"	"	"	"	"
Silver	U			10.0	"	"	"	"	"

OCS-03 (1705002-03) Matrix: Other Sampled: May-04-17 13:35 Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			40.0	mg/L	1000	B17E050	Jun-02-17	Jun-05-17
Barium	U			3.00	"	"	"	"	Jun-05-17
Cadmium	U			2.00	"	"	"	"	Jun-05-17
Chromium	U			5.00	"	"	"	"	"
Lead	U			30.0	"	"	"	"	"
Selenium	U			50.0	"	"	"	"	"
Silver	U			10.0	"	"	"	"	"

OCS-05 (1705002-05) Matrix: Other Sampled: May-04-17 14:23 Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			0.800	mg/L	20	B17E050	Jun-02-17	Jun-05-17
Barium	U			0.060	"	"	"	"	Jun-05-17
Cadmium	U			0.040	"	"	"	"	Jun-05-17
Chromium	U			0.100	"	"	"	"	"
Lead	U			0.600	"	"	"	"	"
Selenium	U			1.00	"	"	"	"	"
Silver	U			0.200	"	"	"	"	"



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OCS-06 (1705002-06) Matrix: Other Sampled: May-04-17 14:37 Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			0.800	mg/L	20	B17E050	Jun-02-17	Jun-05-17
Barium	U			0.060	"	"	"	"	Jun-05-17
Cadmium	U			0.040	"	"	"	"	Jun-05-17
Chromium	U			0.100	"	"	"	"	"
Lead	U			0.600	"	"	"	"	"
Selenium	U			1.00	"	"	"	"	"
Silver	U			0.200	"	"	"	"	Jun-05-17

OCS-07 (1705002-07) Matrix: Other Sampled: May-04-17 14:50 Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			40.0	mg/L	1000	B17E050	Jun-02-17	Jun-05-17
Barium	U			3.00	"	"	"	"	Jun-05-17
Cadmium	U			2.00	"	"	"	"	Jun-05-17
Chromium	U			5.00	"	"	"	"	"
Lead	U			30.0	"	"	"	"	"
Selenium	U			50.0	"	"	"	"	"
Silver	U			10.0	"	"	"	"	"

OCS-10 (1705002-10) Matrix: Other Sampled: May-04-17 15:20 Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			0.800	mg/L	20	B17E050	Jun-02-17	Jun-05-17
Barium	U			0.060	"	"	"	"	"
Cadmium	U			0.040	"	"	"	"	"
Chromium	U			0.100	"	"	"	"	"
Lead	U			0.600	"	"	"	"	"
Selenium	U			1.00	"	"	"	"	"
Silver	U			0.200	"	"	"	"	"



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Reported:
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Metals by ICP, TCLP Extracts using EPA 1311 & 200.7 (modified) US EPA Region 5 Chicago Regional Laboratory

OCS-10 DUP (1705002-11)

Matrix: Other

Sampled: May-04-17 15:20

Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			0.800	mg/L	20	B17E050	Jun-02-17	Jun-05-17
Barium	U			0.060	"	"	"	"	Jun-05-17
Cadmium	U			0.040	"	"	"	"	Jun-05-17
Chromium	U			0.100	"	"	"	"	"
Lead	U			0.600	"	"	"	"	"
Selenium	U			1.00	"	"	"	"	"
Silver	U			0.200	"	"	"	"	"

OCS-12 (1705002-13)

Matrix: Other

Sampled: May-04-17 15:50

Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			0.800	mg/L	20	B17E050	Jun-02-17	Jun-05-17
Barium	3.49			0.060	"	"	"	"	Jun-05-17
Cadmium	U			0.040	"	"	"	"	Jun-05-17
Chromium	0.199			0.100	"	"	"	"	"
Lead	U			0.600	"	"	"	"	"
Selenium	U			1.00	"	"	"	"	"
Silver	U			0.200	"	"	"	"	"

CS-01 (1705003-01)

Matrix: Other

Sampled: May-04-17 11:48

Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			40.0	mg/L	1000	B17E050	Jun-02-17	Jun-05-17
Barium	U			3.00	"	"	"	"	Jun-05-17
Cadmium	U			2.00	"	"	"	"	Jun-05-17
Chromium	U			5.00	"	"	"	"	"
Lead	U			30.0	"	"	"	"	"
Selenium	U			50.0	"	"	"	"	"
Silver	U			10.0	"	"	"	"	"



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CS-03 (1705003-03) Matrix: Other Sampled: May-04-17 12:35 Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			40.0	mg/L	1000	B17E050	Jun-02-17	Jun-05-17
Barium	U			3.00	"	"	"	"	Jun-05-17
Cadmium	U			2.00	"	"	"	"	Jun-05-17
Chromium	U			5.00	"	"	"	"	"
Lead	U			30.0	"	"	"	"	"
Selenium	U			50.0	"	"	"	"	"
Silver	U			10.0	"	"	"	"	Jun-05-17

CS-04 (1705003-04) Matrix: Other Sampled: May-04-17 13:02 Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			0.800	mg/L	20	B17E050	Jun-02-17	Jun-05-17
Barium	0.104	K		0.060	"	"	"	"	Jun-05-17
Cadmium	U			0.040	"	"	"	"	Jun-05-17
Chromium	U			0.100	"	"	"	"	"
Lead	U			0.600	"	"	"	"	"
Selenium	U			1.00	"	"	"	"	"
Silver	U			0.200	"	"	"	"	"

CS-05 (1705003-05) Matrix: Other Sampled: May-04-17 13:12 Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			0.800	mg/L	20	B17E050	Jun-02-17	Jun-05-17
Barium	U			0.060	"	"	"	"	Jun-05-17
Cadmium	U			0.040	"	"	"	"	Jun-05-17
Chromium	U			0.100	"	"	"	"	"
Lead	U			0.600	"	"	"	"	"
Selenium	U			1.00	"	"	"	"	"
Silver	U			0.200	"	"	"	"	"



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CS-06 (1705003-06)

Matrix: Other

Sampled: May-04-17 13:29

Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			40.0	mg/L	1000	B17E050	Jun-02-17	Jun-05-17
Barium	U			3.00	"	"	"	"	Jun-05-17
Cadmium	U			2.00	"	"	"	"	Jun-05-17
Chromium	U			5.00	"	"	"	"	"
Lead	U			30.0	"	"	"	"	"
Selenium	U			50.0	"	"	"	"	"
Silver	U			10.0	"	"	"	"	"

CS-07 (1705003-07)

Matrix: Other

Sampled: May-04-17 13:55

Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			0.800	mg/L	20	B17E050	Jun-02-17	Jun-05-17
Barium	0.302	K		0.060	"	"	"	"	Jun-05-17
Cadmium	U			0.040	"	"	"	"	Jun-05-17
Chromium	U			0.100	"	"	"	"	"
Lead	U			0.600	"	"	"	"	"
Selenium	U			1.00	"	"	"	"	"
Silver	U			0.200	"	"	"	"	"

CS-08 (1705003-08)

Matrix: Other

Sampled: May-04-17 14:15

Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			40.0	mg/L	1000	B17E050	Jun-02-17	Jun-05-17
Barium	U			3.00	"	"	"	"	Jun-05-17
Cadmium	U			2.00	"	"	"	"	Jun-05-17
Chromium	U			5.00	"	"	"	"	"
Lead	U			30.0	"	"	"	"	"
Selenium	U			50.0	"	"	"	"	"
Silver	U			10.0	"	"	"	"	"



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SFS08 (1705004-07)

Matrix: Other

Sampled: May-04-17 15:10

Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			0.800	mg/L	20	B17E050	Jun-02-17	Jun-05-17
Barium	0.166	K		0.060	"	"	"	"	Jun-05-17
Cadmium	U			0.040	"	"	"	"	Jun-05-17
Chromium	U			0.100	"	"	"	"	"
Lead	U			0.600	"	"	"	"	"
Selenium	U			1.00	"	"	"	"	"
Silver	U			0.200	"	"	"	"	"

SFS09 (1705004-08)

Matrix: Other

Sampled: May-04-17 15:23

Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			0.800	mg/L	20	B17E050	Jun-02-17	Jun-05-17
Barium	0.073	K		0.060	"	"	"	"	Jun-05-17
Cadmium	U			0.040	"	"	"	"	Jun-05-17
Chromium	U			0.100	"	"	"	"	"
Lead	U			0.600	"	"	"	"	"
Selenium	U			1.00	"	"	"	"	"
Silver	U			0.200	"	"	"	"	"

SFS10 (1705004-09)

Matrix: Other

Sampled: May-04-17 15:37

Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			0.800	mg/L	20	B17E050	Jun-02-17	Jun-05-17
Barium	1.22			0.060	"	"	"	"	Jun-05-17
Cadmium	U			0.040	"	"	"	"	Jun-05-17
Chromium	U			0.100	"	"	"	"	"
Lead	U			0.600	"	"	"	"	"
Selenium	U			1.00	"	"	"	"	"
Silver	U			0.200	"	"	"	"	"



Environmental Protection Agency Region5 Chicago Regional Laboratory

536 South Clark Street, Chicago, IL 60605
Phone: (312) 353-8370 Fax: (312) 886-2591

RCRA, LCD, US EPA Region 5
77 West Jackson Boulevard
Chicago IL, 60604

Project: Mid America Steel Drum, Inc.
Project Number: MASD-05-04-17
Project Manager: Jamie Paulin

Reported:
Jul-13-17 12:07

Metals by ICP, TCLP Extracts using EPA 1311 & 200.7 (modified) US EPA Region 5 Chicago Regional Laboratory

SFS10 Dup (1705004-10)

Matrix: Other

Sampled: May-04-17 15:37

Received: May-05-17 07:50

Analyte	Result	Flags / Qualifiers	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed
Arsenic	U			0.800	mg/L	20	B17E050	Jun-02-17	Jun-05-17
Barium	1.20			0.060	"	"	"	"	Jun-05-17
Cadmium	U			0.040	"	"	"	"	Jun-05-17
Chromium	U			0.100	"	"	"	"	"
Lead	U			0.600	"	"	"	"	"
Selenium	U			1.00	"	"	"	"	"
Silver	U			0.200	"	"	"	"	Jun-05-17



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Notes and Definitions

K	The identification of the analyte is acceptable; the reported value may be biased high. The actual value is expected to be less than the reported value.
U	Not Detected
NR	Not Reported
Q	QC limit Exceeded